National Ground-Water Monitoring Network

Advisory Committee on Water Information—Subcommittee on Ground Water

National Ground-Water Monitoring Network Data Portal

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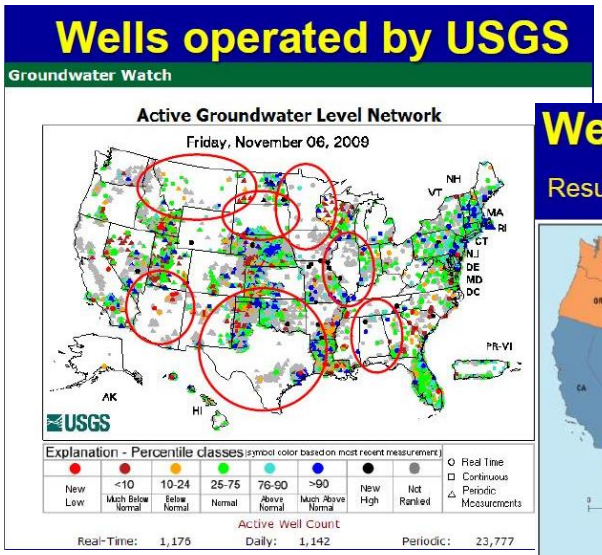
Subcommittee on Ground Water Meeting
September 16th, 2014

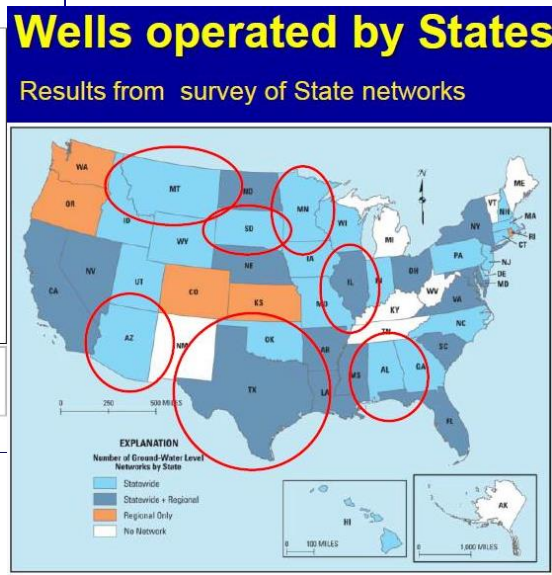
Outline:

- Background
- Current functionality
- Recent progress
- Development Plans
- The long view
- Q&A

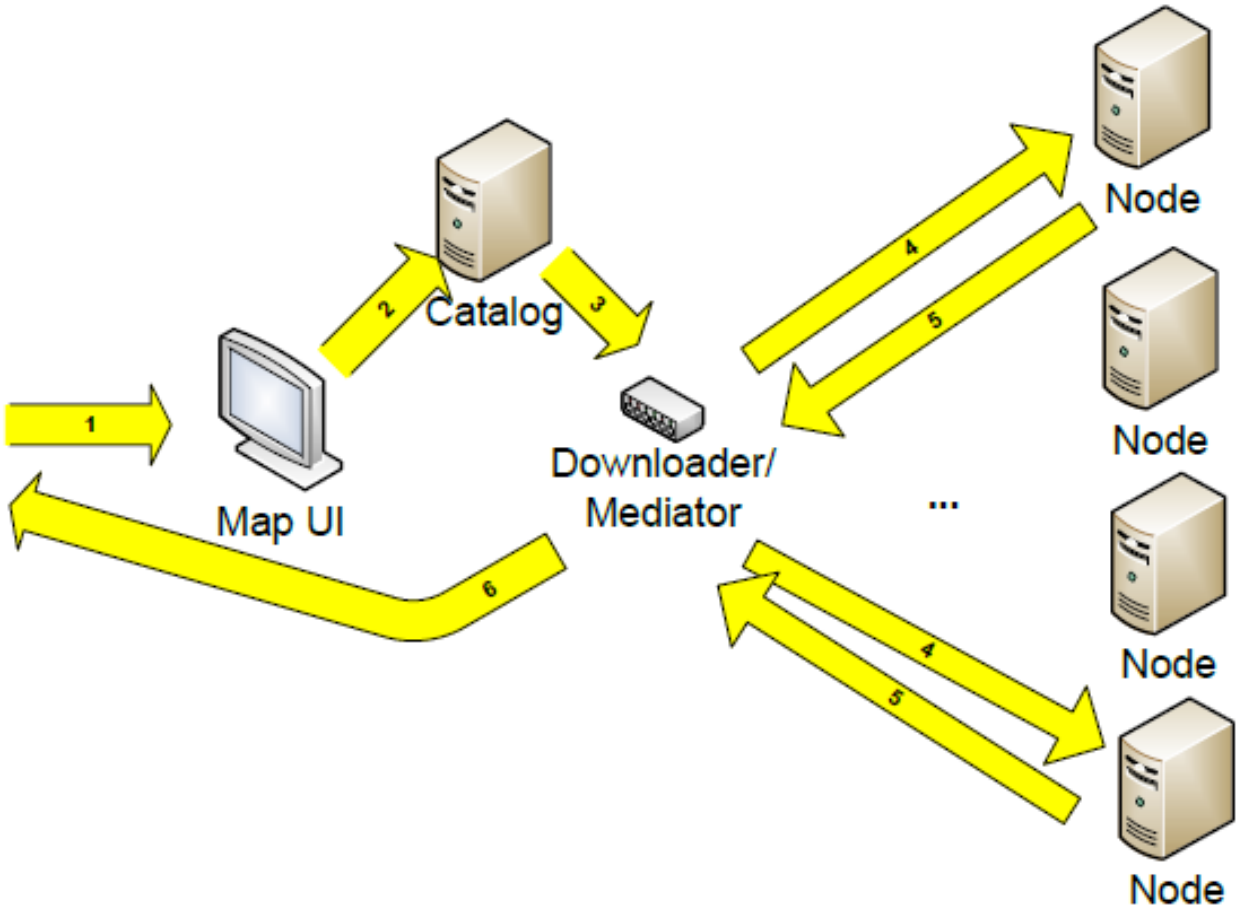
Portal Objectives:

- Integrate National, State and Local GW data
- Make all data available through a single web portal
- Automated data transfer from data providers, through portal, to public user
- Dynamically access data from original source
- Real-time or near real-time data available
- Data Available
  - Well characteristics
  - Water levels
  - Water-quality

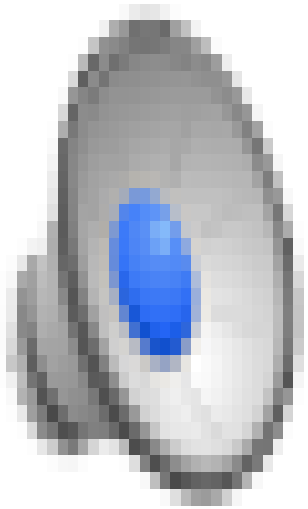




Distributed Architecture



Distributed Architecture

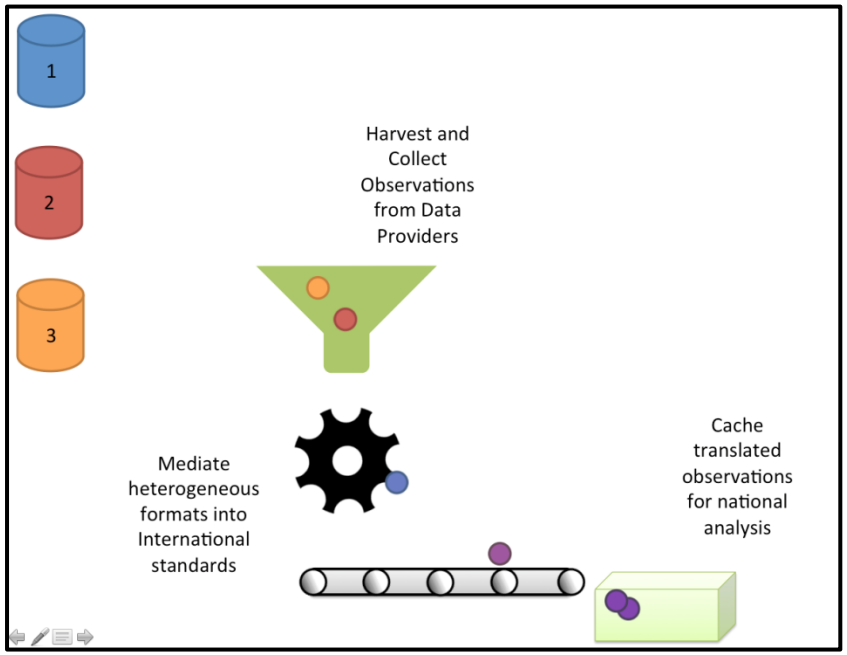


Lessons Learned & Challenges

- Data provider technical capabilities vary
- Complicated organizational structures
- Some missing data elements (minimal)
- Structure of well log data varies greatly
- Some spatial and temporal data gaps
- Consistent data quality
- Outages, reliability of services
- Large number of services to mediate

Infrastructure Enhancements:

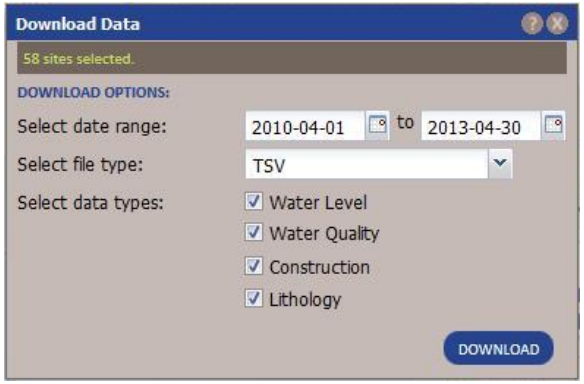
- Scale-up service infrastructure to support full implementation
  - Performance
  - Reliability
  - Stability
- Data availability filtering
- Multi-site download
- Advanced query support



New User Interface:

- New Look & Feel
- Fine tuned control of site selection for download
- Intuitive map controls (zooming, panning, selecting)
- Enhanced filter – map interaction
- Built-in help & explanations
- New filter options
  - Data availability
  - State / county
  - Filter refresh
- New download options

(date filter, file type selector)



NGWMN Data Portal Today

ACWI
Advisory Committee on Water Information

National Ground-Water Monitoring Network

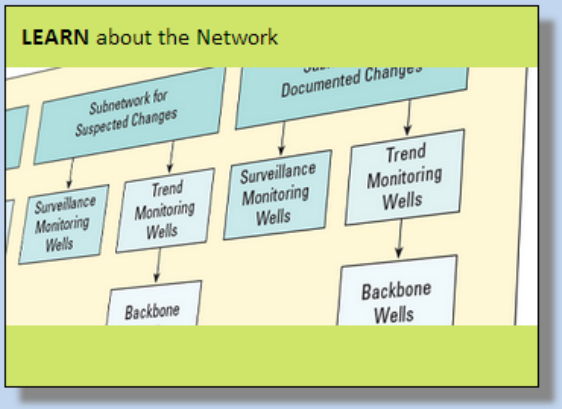
The National Ground-Water Monitoring Network (NGWMN) is a compilation of selected groundwater monitoring wells from Federal, State, and local groundwater monitoring networks across the nation.

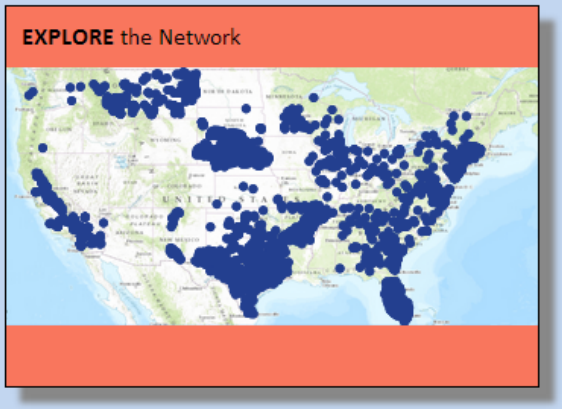
The NGWMN is a product of the Subcommittee on Groundwater of the Federal Advisory Committee on Water Information (ACWI).

The NGWMN Data Portal provides access to groundwater data from multiple, dispersed databases in a web-based mapping application. The portal contains current and historical data including water levels, water quality, lithology, and well construction. The NGWMN is transitioning from a pilot phase into full implementation. In the future we will be adding additional data providers to the network.

NETWORK STATUS:

- 3,023 wells
- 29 states
- 48 Principal Aquifers
- 4,587,063 Water Levels
- 215,912 Water Quality Samples





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National Groundwater Monitoring Network

The National Ground Water Monitoring Network (NGWMN) is a compliation of selected wells monitoring groundwater aquifers all around the nation. The NGWMN Data Portal brings real-time groundwater data together in one place to provide users with current and reliable information for the planning, management, and development of groundwater resources.

About the Network

BACKGROUND NETWORK DESIGN NETWORK STATUS

Background

The NGWMN network is sponsored by the Advisory Committee on Water Information's (ACWI) Subcommittee on Ground Water (SOGW) and was established in 2009 with a pilot network.

The goal of the National Ground Water Monitoring Network (NGWMN) is to provide information needed for planning, management, and development of groundwater supplies to meet current and future water needs and ecosystem requirements. This will be accomplished by aggregating suitable groundwater data from local, State, and Federal organizations. A consensus-based framework document (http://acwi.gov/sogw/pubs/tr/) was developed to provide guidance to ensure that the data are comparable and can be included in a nationally consistent network. The framework design focuses on providing information needed to assess the quantity of groundwater reserves as constrained by quality. The scale of the network focuses on Principal and Major Aquifers of the United States.

Network Design

The network is composed of selected wells from existing Federal, multistate, State, Tribal, and local groundwater monitoring networks. The scale of the network will focus on Principal and Major Aquifers of the United States. Well classification subnetworks and monitoring categories are defined in the framework document (http://acwi.gov/sogw/pubs/tr/index.html) and are briefly described here:

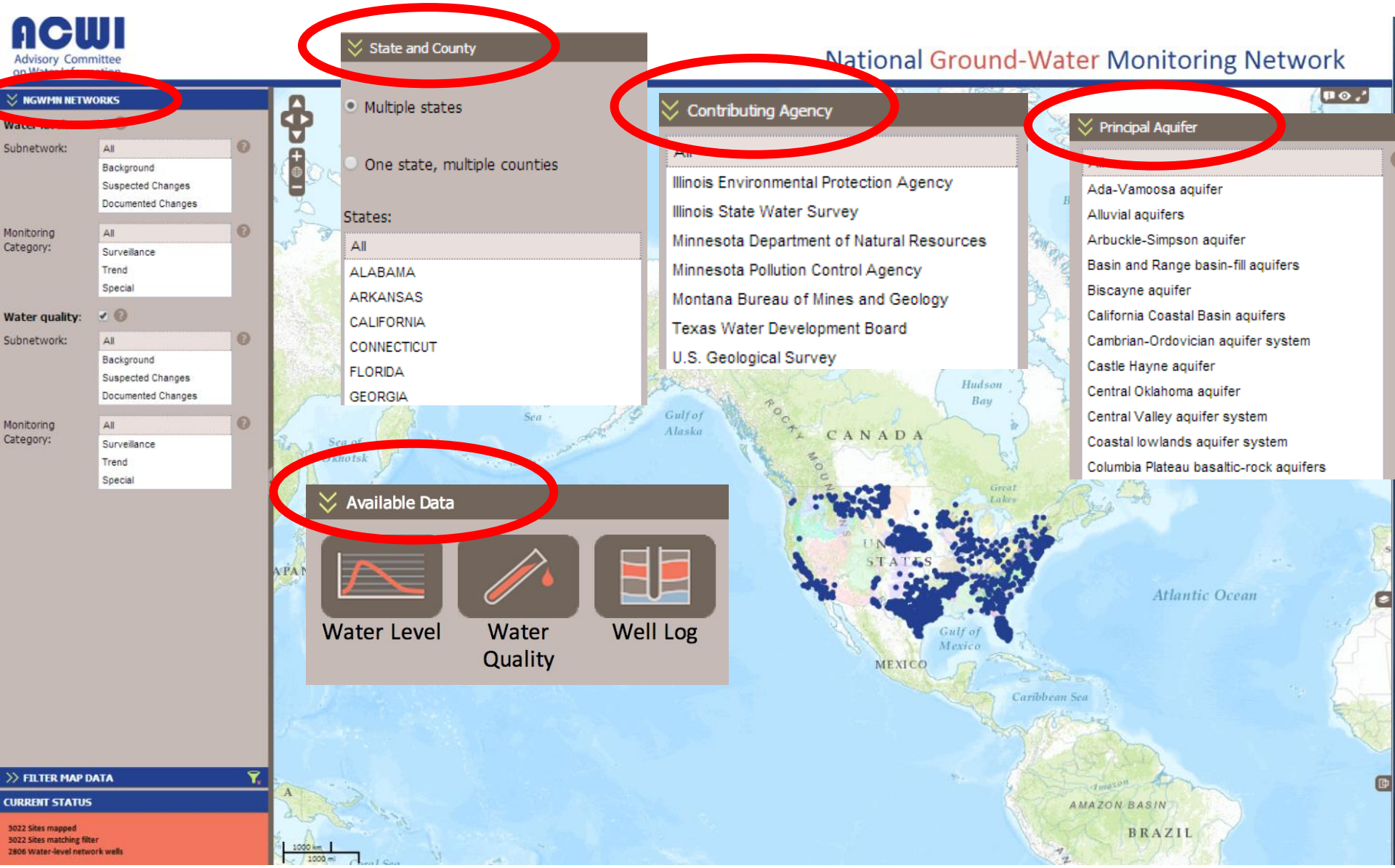
Well Classification Subnetworks:

Wells in the NGWMN will be designated as being in one of three subnetworks. These are 1) the Background subnetwork, 2) the Suspected Changes subnetwork, and 3) the Documented Changes subnetwork.

Background subnetwork:

Monitoring points that provide data from aquifers or parts of aquifers with no (or minimal)

Methods of Site Selection



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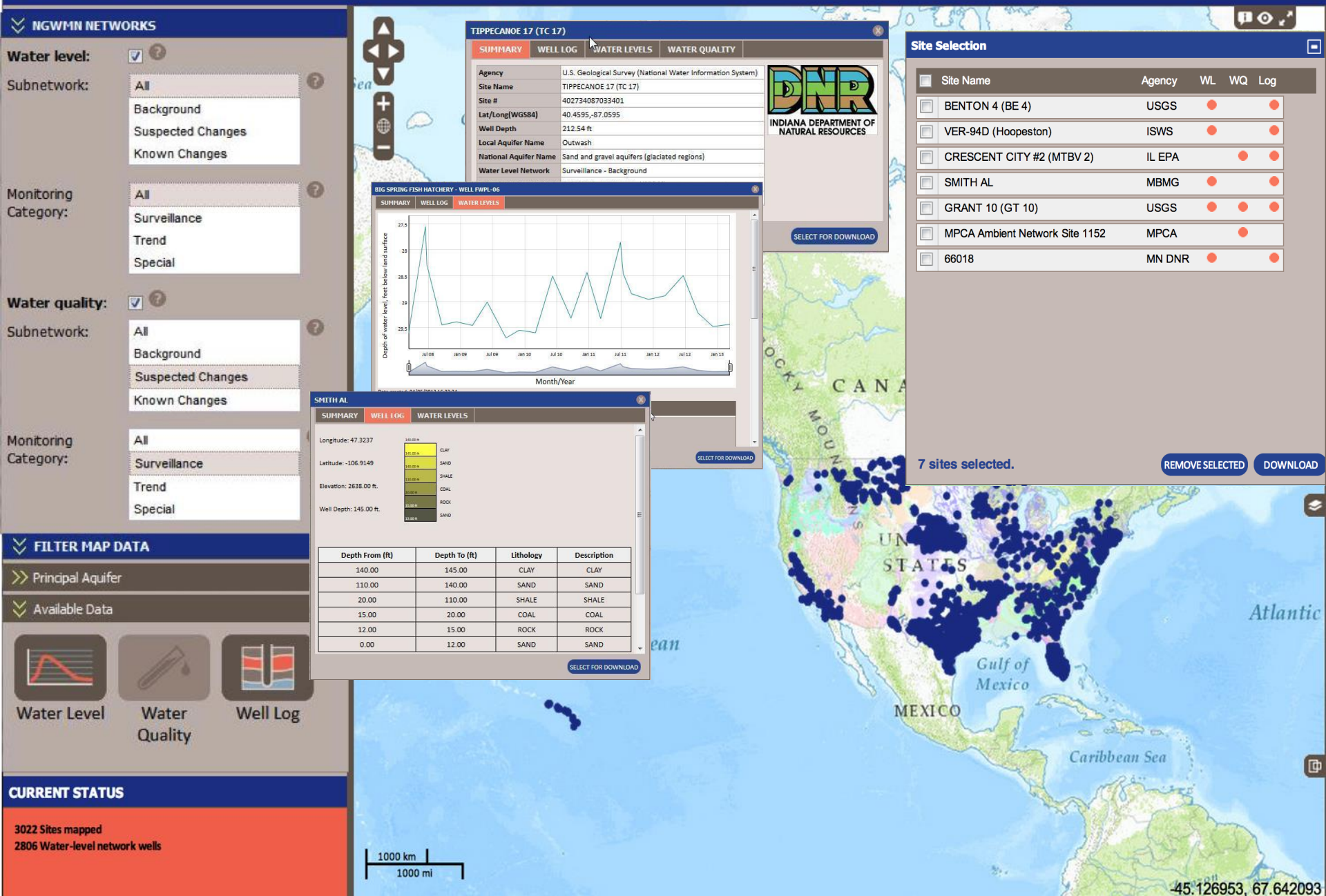
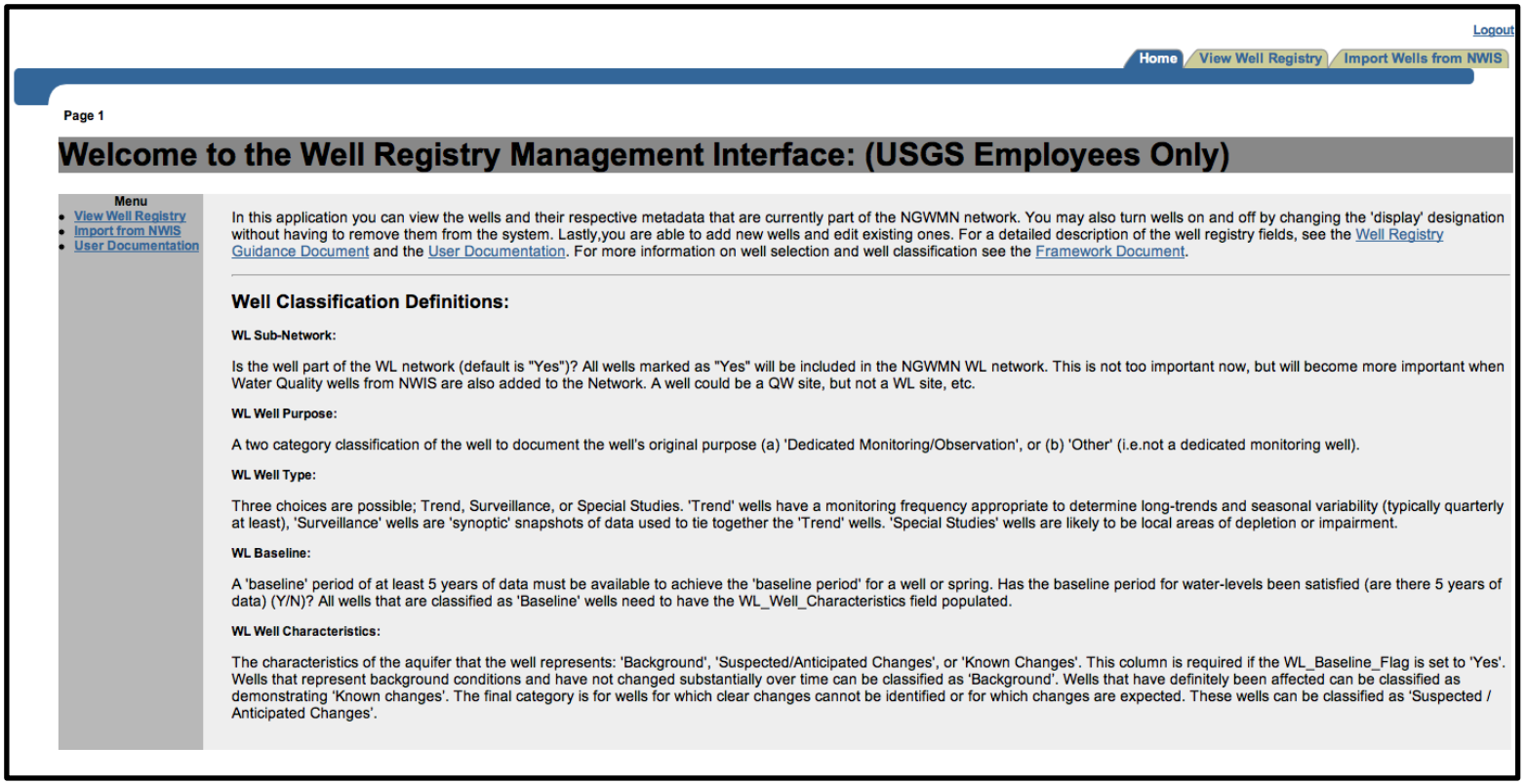
National Ground-Water Monitoring Network



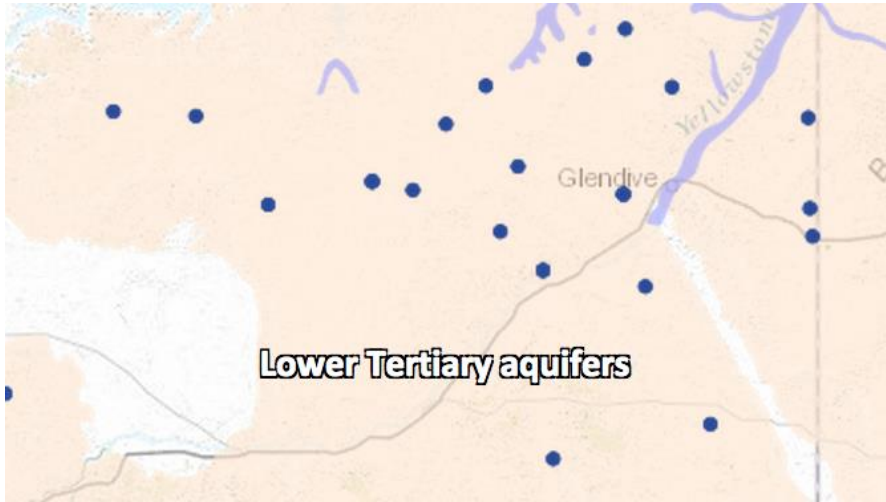
Well Registry Management

- Data Providers can manage well information
- Logging of changes to well classification
- Review of well data for managers



FY14 Portal Improvements

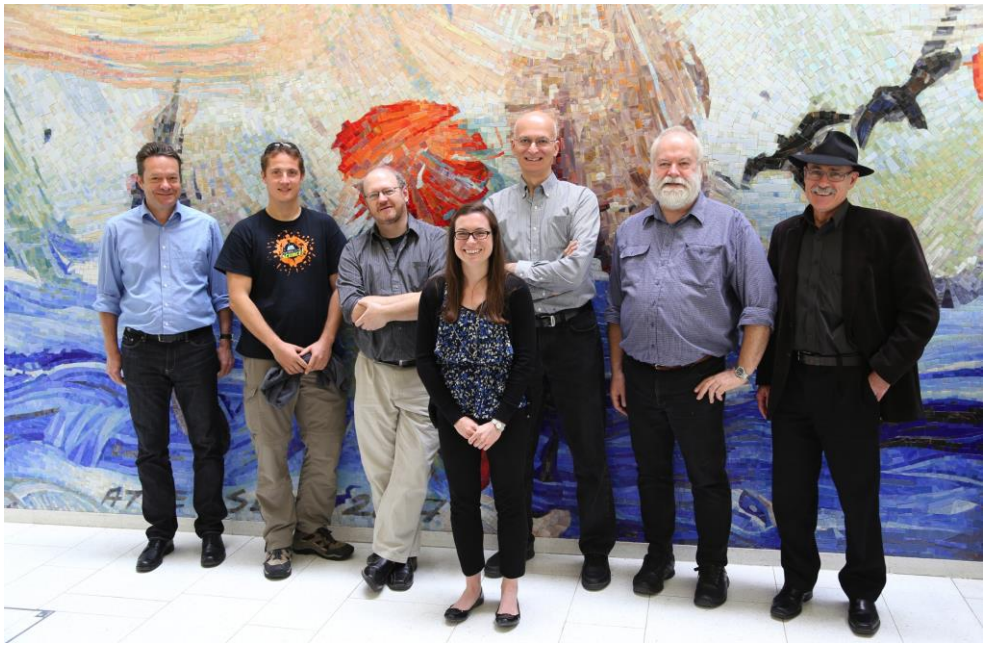
- Hooked-up MBMG services for QW & daily WL's
- Developed WaterML2 Sensor Observation Service
- Provider service outage notifications
- Improvements to data download
- Alluvial aquifers layer & aquifer ID
- Aquifer lithology filter
- Involvement with GWML2 standard development



Groundwater Data Standards

- GWML2 in development (4 packages)
  - main, groundwater flow, groundwater well and groundwater constituent
- Groundwater Interoperability Experiment 2
- 5 Use Cases:
  - Commercial
  - Policy
  - Environmental
  - Scientific
  - Technologic

GW2IE Meeting -- May 5-8, 2014



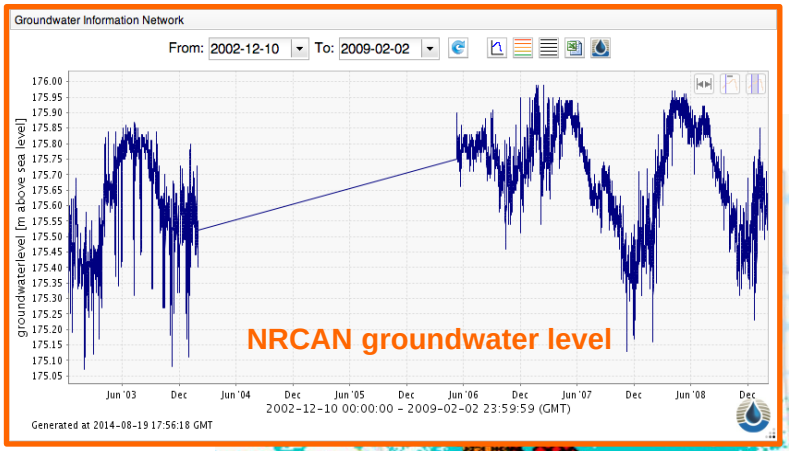
From left to right: Bernhard Wagner (GSG), Alex Kmoch (U Salzburg), Eric Boisvert (NRCAN), Jessica Lucido (USGS), Boyan Brodaric (NRCAN), Peter Dahlhaus (FedUni), Bruce Simmons (CSIRO)

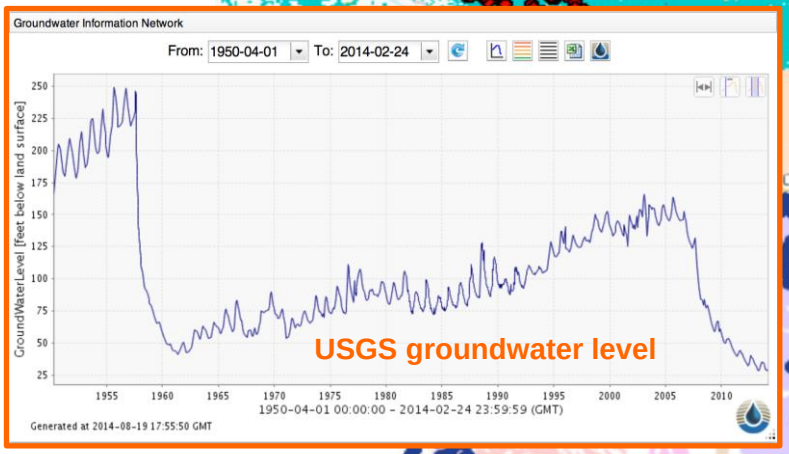
International Coordination

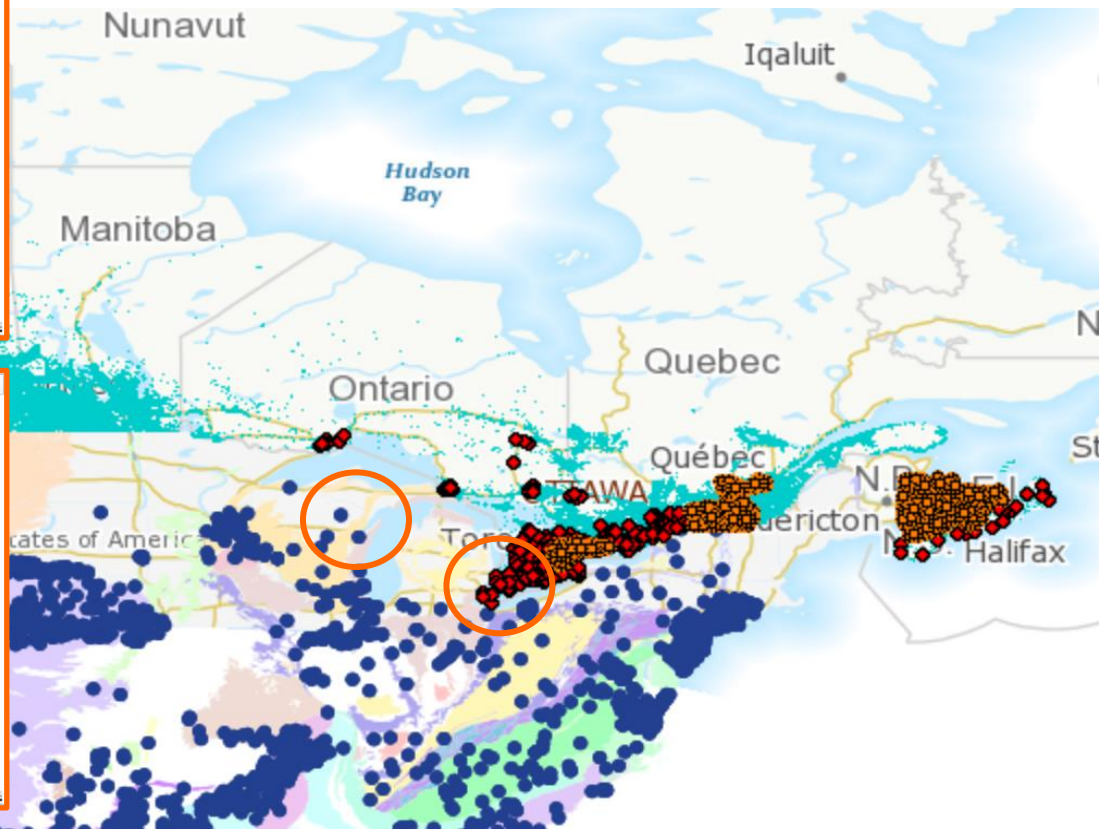
Data Interoperability

CAN: water wells (NRCAN); groundwater levels

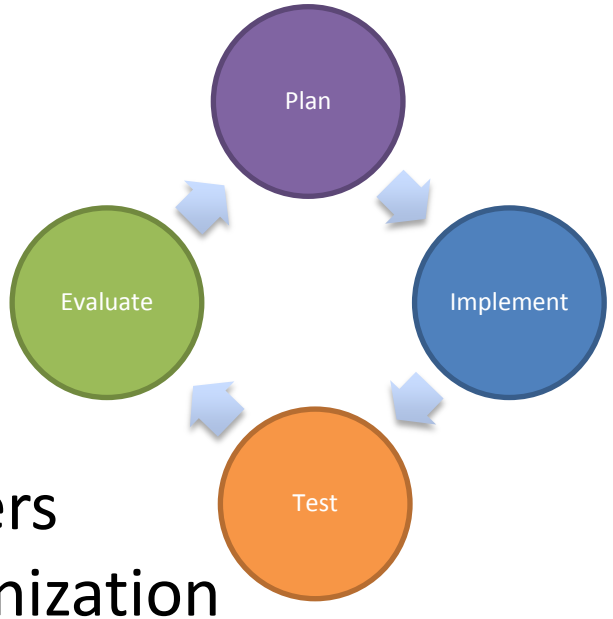
USA: water wells (USGS); groundwater levels







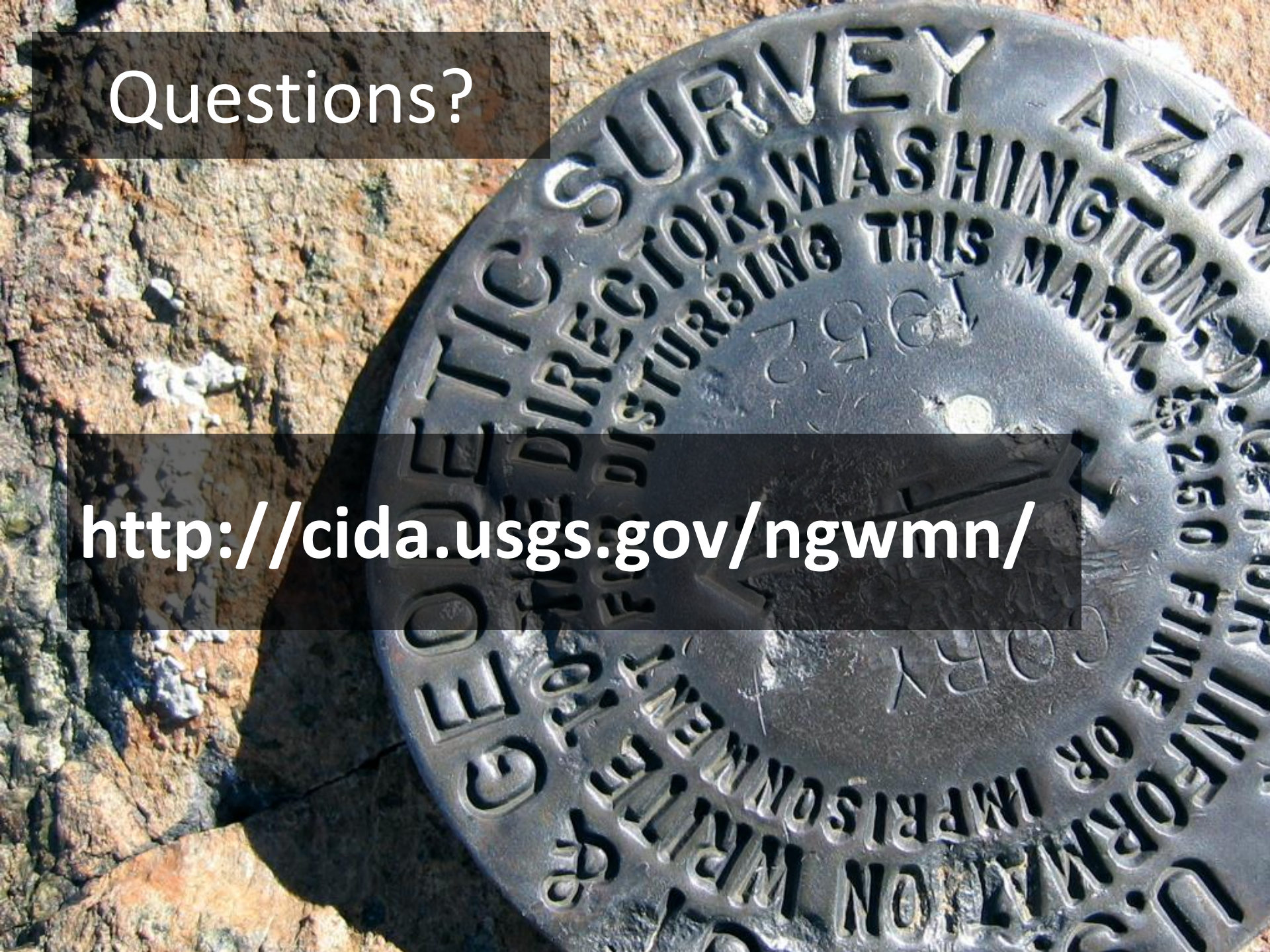
FY15 Plans



- Work with new data providers
- Document provenance of data providers
- Attribute datasets to appropriate organization
- Streamline data service mediation process
- Summary statistics of data selected by user
- Implement saved filters and site selections
- Display figure of well construction data
- Visualizations of current groundwater quality or quantity at a glance
- Additional site filters (data POR, QW result, etc…)
- Improve & document portal data services (output)

The Long View…

- Work with new & existing data providers to add new datasets
- Streamline data cross-walking process
- Portal mobile compatibility
- Inclusion in the Open Water Data Initiative
- Include remotely sensed or modeled data sources
- Include aquifer information


Questions?
http://cida.usgs.gov/ngwmn/